



By Retired Air Force Major Dale J. Long

"Of all the monsters that fill the nightmares of our folklore, none terrify more than werewolves, because they transform unexpectedly from the familiar into horrors. For these, one seeks bullets of silver that can magically lay them to rest."

– Frederick P. Brooks Jr.

No Silver Bullet – essence and accidents of software engineering

In the beginning, it all sounded so simple, use Total Quality Management (TQM) techniques to improve organizational effectiveness. But is it that simple? Try mixing and matching the silver bullets below with the desired outcomes and see if any of the resulting phrases sound familiar:

Total Quality Management	Reduce our costs.
Strategic Planning	Improve our products.
Management by Objectives (MBO)	Increase our productivity.
Object-Oriented Programming (OOP)	Make us a better organization.
Business Process Reengineering (BPR)	Make our customers happy.
Extensible Markup Language (XML)	Make our employees happy.
Mint Condition Beanie Babies	Fund my child's college education.

The quote from Fred Brooks is from his classic essay on the myth of a free lunch and magical solution or silver bullet for software development problems. However, I believe his insight applies to any magical solution to whatever ails an organization.

Before we go into details I would like to state that, with the exception of investing in Beanie Babies, all the techniques listed above have shown some durable value over time. However, each has also had its reputation tarnished by high profile failures, usually by organizations that implemented them in name only without adhering to their core principles.

At some point government agencies and some notable industries have tried or are engaging in initiatives that will result in high performance. On the short list of the management initiatives currently in vogue are Lean Six Sigma, Capability Maturity Models, the Balanced Scorecard and the Malcolm Baldrige National Quality Program, among others. While the attempts at process improvement are laudable, and, in some cases, mandated, organizations can encounter pitfalls along the way.

In the interest of protecting current and future investments in process improvement, let's look at some lessons learned from programs of 10 to 20 years ago to see how a potentially good silver bullet can misfire.

The Appearance of Quality

TQM was originally developed in Japan during the 1950s and later become well-known in the United States in the 1980s. TQM focuses on an organization's culture, attitude and structure to provide customers with products and services that satisfy their needs. TQM stresses quality in all aspects of the company's operations, for example, do things right the first time while eliminating operational waste and defects.

After some successes by early adopters, many public and private organizations implemented TQM principles as a cure to various organizational ailments with varying results.

The key concepts of TQM are:

Customer-driven quality. Under this concept, an organization will only be successful if its customers are satisfied. Being sensitive to customer requirements goes beyond merely meeting requirements or resolving complaints. Each organizational component also operates within the organization as a customer to some functions and as a supplier to others. Each component must treat its internal customers with the same sensitivity and responsiveness as it does for external customers.

Leadership and commitment from top management. For TQM to succeed, top management must articulate clear goals for the organization and create and deploy well-defined systems, methods and performance measures for achieving those goals.

Continuous improvement. This is the heart of TQM. A high performing organization understands that customer satisfaction is obtained by providing a high-quality product while also continuously improving the product.

TQM also recognizes that product quality is the result of process quality, so there is a focus on continuous improvement of the organization's processes, which includes a strong emphasis on preventing problems before they occur.

Rapid response. This one is pretty straightforward. The faster you can respond effectively, the happier your internal and external customers will be.

Fact-based actions. TQM focuses on using objective data, statistical analysis and performance tracking. While these are common elements of most management systems, a unique aspect of TQM is that it recognizes that most problems are system-related, rather than caused by individual employees.

In practice, data are collected and put in the hands of the people who are in the best position to analyze results, not managers, but the workers in the midst of the process.

Employee empowerment. TQM requires a committed, well-trained workforce that participates fully in quality improvement activities. The organization gives employees key process data and encourages them to take more responsibility, communicate more effectively, act creatively and innovate continuously. Any employee can stop a process if he or she finds defects.

TQM sounds marvelous, much like apple pie, motherhood and democracy. However, like democracy, TQM is a participatory culture. Thin, superficial applications simply won't provide any lasting value. Studies of TQM implementations over the last 20 years indicate that attempts to integrate TQM into both public and corporate organizations failed at a rate of 64 to 77 percent. TQM generally fails when:

- Internal processes become more important than serving customers, either internal or external.

- Top management delegates responsibility for TQM to lower levels and then moves on to the next initiative.
- Products are considered “good enough” and when processes, “ain’t broke, don’t fix ‘em.”
- Employees are rewarded for following internal rules instead of being responsive.
- Management hides bad data to avoid embarrassment.
- Employees are either not given responsibility or not trained to accept it.

However, even when you try to implement something like TQM correctly, it still might not take hold. One of the headquarters organizations that I worked under while on active duty committed to TQM. A flag officer personally led the first day of training for all employees and all 1,500 employees received at least 40 hours of TQM training. We went by the book in implementing the program.

Two years later, the only consistent sign of TQM that remained were some people who insisted on using meeting agenda forms, though participants in many meetings didn’t stick to them. Some pockets of quality remained, but given the normal churn rate of people into and out of any military organization, trained employees were regularly replaced by people with a different outlook. Departing employees left for other assignments with a different quality emphasis.

Yes, there was probably a positive effect overall on the organization due to everyone being exposed to TQM, but it did not result in a sweeping transformation of organizational culture. Once the push for TQM relaxed, entropy developed, and we returned to pretty much where we were before.

There are two other topics I would like to discuss in relation to silver bullets: change and the sunk cost fallacy.

Change Requires Force

Newton’s First Law of Motion states that unless acted upon by an external force, a body at rest will remain at rest and a body in motion will remain in motion.

Taken at face value, the first part of the statement agrees with what we see every day. Leave a book on a table and that book will stay there, unless an external force moves it. Please bear in mind, however, that “rest” does not mean an absence of force. In the case of the book, gravity (another of Newton’s favorites) pulls it down and the table holds it up. Rest, in the case of motion, essentially means zero net force — not just an absence of force.

The second part of the law states that a body in motion will keep moving unless acted upon by an external force. This part is not generally supported by what we perceive in the physical world. If we set an automobile in motion and then apply no further force it will eventually come to rest through a combination of gravity and friction, external forces that act on it to deplete the force moving it.

To keep the car in motion, we need to provide external force sufficient to counter the forces acting against the motion to achieve zero net force. The car will stay in motion as long as we maintain this balance.

There is one other principle of this law that we should consider before relating it to organizational change: Uniform linear motion is the natural state of motion. To use a more familiar phrase: Motion takes the path of least resistance, which is usu-

ally a straight line. Keeping the car in motion and changing the direction and speed of the car take more force than simply keeping it rolling in a straight line.

The term we normally use to represent Newton’s First Law of Motion is “inertia,” which relates to an object’s amount of resistance to change in velocity. In this context, organizations generally remain both “in motion,” at least internally, due to their constant activity and “at rest” due to a zero net force balance of forces in how they operate.

In other words, we chug along at a relatively constant speed and direction unless some force acts upon us to change things.

Introducing TQM (or Lean Six Sigma) into an organization is an attempt to change velocity, either internally, externally, or both. Overcoming organizational inertia usually requires sustained effort over time. Depending on the amount of resistance, the amount of force required is at least inversely proportionate to the length of time in which you try to make the change. In essence, it takes at least 10 times the force to make a change in one year than it does to make the same change over 10 years.

One of the reasons silver bullets get their name is that people who employ them expect instant results, not gradual change over time. They are an attempt at, as the name suggests, a violent solution to what ails us. Applied with this intent, however, all they are likely to do is put a hole in your foot.

Sink Faster

There is one other element that contributes to the organizational pain of self-inflicted silver bullet wounds: the sunk cost fallacy (SCF). This delusion takes the form of thinking that just because we’ve spent a lot of money on something, giving up on it would “waste” the money already spent.

Devotees of the SCF believe that all they need to do to fix things is to spend even more money to get things back on track. Unfortunately, spending more money is like loading extra gold bullion onto a ship that’s already holed below the waterline.

It’s mainly a matter of pride. No one really wants to admit that a beloved brainchild has gone awry. Like a gambler on a losing streak, all but the most realistic of us will keep playing in the hopes of getting even.

The sunk cost fallacy is the reason why some organizations push new changes long after it becomes apparent that they will not make any substantive difference. SCF is why professional sports teams sometimes keep playing marginally performing stars with huge contracts instead of replacing them with potentially better, but lower paid players.

The sunk cost fallacy is how, for example, you can start with a \$8.3 billion plan to build a space station and, after you’ve spent \$100 billion, it’s still not finished and probably won’t work as originally envisioned when it is.

The kings of the SCF were WorldCom and Enron. Both companies were, for a while, at the top of their markets. However, as we found out later, they propped up their financial operations with schemes that might best be described as the corporate version of an M.C. Escher sketch where people climb endlessly up stairs in a circle. It makes for interesting art, but you cannot sustain the illusion in the real world.

And yet, even when it was apparent that things were going badly, WorldCom’s chief executive officer, Bernard Ebbers, still managed to convince the WorldCom board of directors to lend

him \$400 million to try and get things back on track.

The best ways to prevent sunk costs are to establish concrete, measurable benchmarks for any change. If you do not meet these benchmarks, do not spend any more money until you reassess what you are really trying to achieve and where your plans went awry. There has to be a benefit to going forward other than not wanting to admit failure or waste money already spent. We must be prepared to cut our losses if we can't meet our targets.

One good example of this was a government project to build an immense underground 54-mile ring particle accelerator under Waxahachie, Texas. After 14 miles of tunnels had been dug, Congress canceled the Superconducting Super Collider in 1993 due to cost estimates rising well beyond initial estimates. We may have spent \$2 billion for a 14-mile hole in the ground, but at least we didn't spend \$20 billion for a bigger one.

Closing Thoughts

In summary, here are my thoughts on firing silver bullets:

- Choose your ammunition carefully. Do not attempt to kill mosquitoes with a howitzer or elephants with a BB gun.
 - Choose your target carefully. Some things that look enticing may prove to be bulletproof no matter how well you implement.
 - Match your expectations of how long the change will take to the size of the change. If you intend to transform your entire organization, you should allow one year for every level in the organization between the person in charge and the lowest level employee.
- A good example of this was the Defense Department's transformation to a joint environment. Congress passed the Goldwater-Nichols Act in 1986, and DoD completed most of the transformation 10 years later.
- Be ruthless. If an initiative is not meeting targets, either revise your expectations or kill the project.
 - Do not turn people into targets for change. They tend to resent it and resist. Instead, give them weapons and turn them into shooters. The more people you have on your side firing in the same direction, the more likely it will be that your silver bullets will find their mark.

Until next time, Happy Networking!

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"Big T" Hosts PEO EIS Working Group

By Mass Communications Specialist (SW/AW) Kelly Morgan

Supporting the Naval warfighter, the amphibious assault ship, USS Tarawa (LHA 1), hosted a working group conference Dec. 12, 2006, chaired by Rear Adm. Timothy Flynn, Program Executive Officer for Enterprise Information Systems (PEO-EIS).

The PEO EIS team came aboard Tarawa to interact with the Naval warfighter and get honest feedback and suggestions from fleet Sailors on the PEO EIS product line. The team was very interested in seeing how their products that are currently deployed are put into play aboard a large deck "amphib."

Flynn currently oversees a portfolio of large-scale information technology projects and programs designed to enable common business processes and provide standard information technology capabilities to the Department of Navy. They include the Navy Marine Corps Intranet (NMCI), Navy Enterprise Resource Planning (ERP), Global Combat Support System-Marine Corps (GCSS-MC), Sea Warrior, Navy Standard Integrated Personnel System (NSIPS) and the Navy Manpower, Personnel, Training and Education (MPT&E) portfolio.

The admiral was accompanied by two Senior Executive Service personnel, engineering and acquisition staff and various program managers. Together, they toured the big deck "gator" lending their experience and support to Sailors and Marines along the way. In doing so, they engaged with the Office of the Chief of Naval Operations on the Next Generation Enterprise Network, the NMCI, in both CONUS and OCONUS implementations, pierside services and more.

"This visit provided a tremendous opportunity to meet an outstanding crew," Flynn said, in response to the ship's capabilities and manpower.

In reference to combat systems and combat readiness, the admiral asked about the services and systems the Space and Naval Warfare Systems Command (SPAWAR) currently provides to the fleet in comparison with the now outdated IT-21 program.

The admiral was very impressed with the knowledge of Tarawa's Sailors and the informative briefs that he received during his visit.

Prior to departing the Big T, Flynn expressed his appreciation to Tarawa's crew for their feedback during the team's visit.

For more information about the PEO EIS, go to the SPAWAR Web site at <http://www.spawar.navy.mil> and click on the PEO EIS seal. For more information about Tarawa, contact PAO@Tarawa.navy.mil.



Chief Petty Officer Nelson Mozzini, foreground, attached to Commander Amphibious Squadron One, explains the integration process between the Joint Operations Center and Combat Information Center to Rear Adm. Timothy Flynn, Program Executive Officer Enterprise Information Systems, right, background, and his team, aboard the amphibious assault ship USS Tarawa (LHA 1) in San Diego. U.S. Navy photo by Mass Communications Specialist Third Class (SW/AW) Kelly Morgan.

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